

WHAT IS CLAIMED IS:

1. A method for processing and forwarding data packets comprising the steps of:

5 - providing at least one route table comprising entries containing an input index field and at least one operation code or a program for the execution of an operation,

- assigning a selector serving as indexing datum to each data packet, the data packet and its selector being parts of a token,

10 - matching of the selector of a packet matched with the input index field of the entries of said at least one route table,

- execution on the matched token of the at least one operation contained in the at least one matched route table entry.

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2. A method as claimed in claim 1, wherein the route table entries further contain an output index field, wherein at least one multi-set of tokens is maintained, that every matched token is removed from said at least one multi-set, that the packet of such a matched token, depending on the semantics of the operation referenced by the matched route table entry, is forwarded or destroyed or at least one new token is generated and again added to one of said at least one multi-sets, the selector of said at least one new token being copied from the output index field of the matched route table entry or being otherwise computed.

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30 3. Method as claimed in claim 2, wherein tokens can be temporarily removed from said at least one multi-set and reinserted later on.

4. Method as claimed in claim 2, wherein a control unit is provided which selects the tokens from the multi-set to be matched with entries of the route table.

5 5. Method as claimed in claim 1, wherein the route table comprises at least one entry containing one of operation code and a program that can take care of at least one of entering parts of the contents of a data packet containing operation code into a route table entry and of removing or changing existing route table entries.

10 6. Method as claimed in claim 1, wherein at least one of operation code and of a program contained in at least one route table entry comprises an extension.

15 7. Method as claimed in claim 6, wherein the route table comprises at least one entry containing at least one of operation code and of a program that can take care of altering an extension or other modules based on information contained in a data packet.

20 8. Method as claimed in claim 5 or 7, wherein at least one token containing operation code is assigned a program flow and that at least one of the operation code and its selector and of other data stored in this token is formed such that this program flow is executed based on information contained in the token and in the route table.

25 9. Method as claimed in claim 1, wherein tokens for which no match with entries of the route table is possible, are deleted.

30 10. Method as claimed in claim 1, wherein at least one default processing routine is provided and wherein tokens for which no match with an input index field of an entry of the

at least one route table is possible are processed by one of said at least one default processing routines.

5 11. Method as claimed in claim 1, wherein the at least one route table has a data structure that is different from a table structure and is for instance the structure of an array of records or a linked list of memory zones.

10 12. Method as claimed in claim 1 or 11 wherein auxiliary data structures, for instance hash tables or other lookup mechanisms, are provided to access the entries of said at least one route table.

15 13. Method as claimed in claim 1, wherein at least one route table entry contains more than one operation.

20 14. Method as claimed in claim 1, wherein the selection of route table entries that match a given token is non-deterministic.

25 15. Method as claimed in claim 1, wherein a token's indexing datum is one of being embedded in and of being deductible from the token's data packet.

16. Apparatus for processing and forwarding data packets wherein the following items are provided.

- at least one route table comprising entries containing an input index field and at least one of operation code and of a program for the execution of an operation,
- means for assigning a selector serving as indexing datum to each data packet, the data packet and its selector being parts of a token,
- means for matching the selector of a packet with the input index field of the entries of said at least one route table,

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- means for executing on the matched token the at least one operation contained in the at least one matched route table entry.

5 17. Apparatus as claimed in claim 16, comprising at least one microprocessor the architecture of which implements at least one of said items.